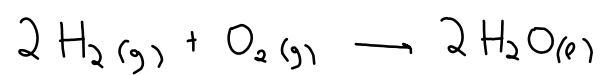


Ch 8 Chemical Reactions  
(RxnS)

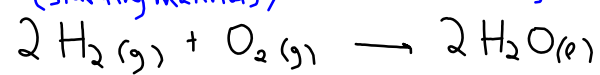
Ch 8 Chemical Reactions  
(RxnS)



Ch 8 Chemical Reactions  
(RxnS)

Reactants  
(Starting materials)

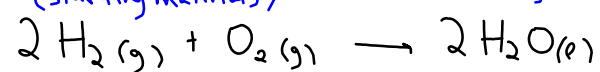
Product  
(Resulting Materials)



Ch 8 Chemical Reactions  
(RxnS)

Reactants  
(starting materials)

product  
(Resulting Materials)

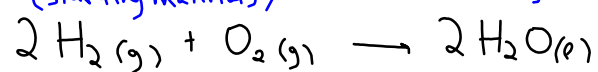


~~\*~~ all Rxns must abide to the LCM

Ch 8 Chemical Reactions  
(Rxn's)

Reactants  
(starting materials)

product  
(Resulting Materials)



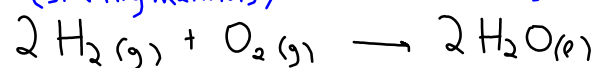
★ all Rxn's must abide to the LCM

↳ Rxn's must be balanced

Ch 8 Chemical Reactions  
(Rxn's)

Reactants  
(starting materials)

product  
(Resulting Materials)



★ all Rxn's must abide to the LCM

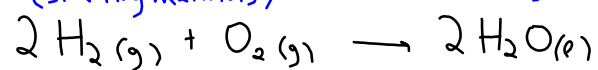
↳ Rxn's must be balanced

all atoms of Reactants must all the  
atoms of products!

Ch 8 Chemical Reactions  
(RxnS)

Reactants  
(starting materials)

product  
(Resulting Materials)

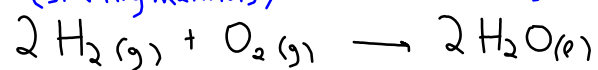


↑  
Balance Eqns w/ coefficients  
which distribute to elements in comp

Ch 8 Chemical Reactions  
(RxnS)

Reactants  
(starting materials)

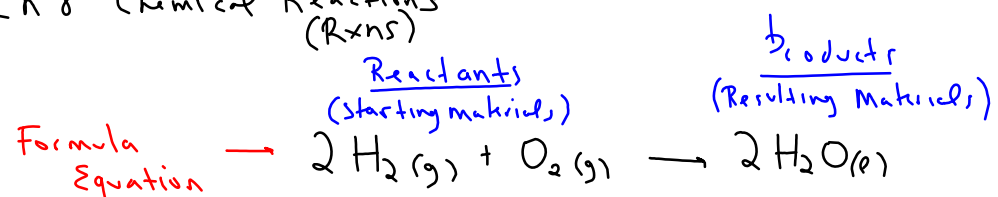
product  
(Resulting Materials)



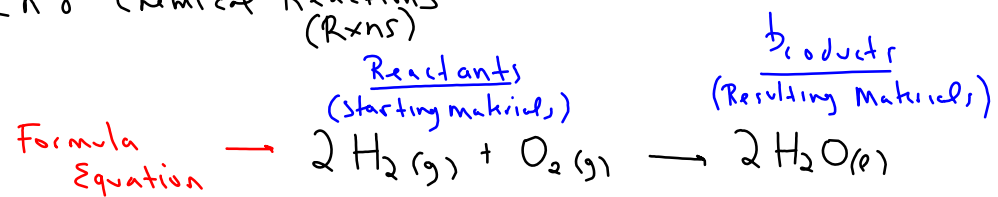
↑  
Balance Eqns w/ coefficients  
which distribute to elements in comp



Ch 8 Chemical Reactions  
(RxnS)

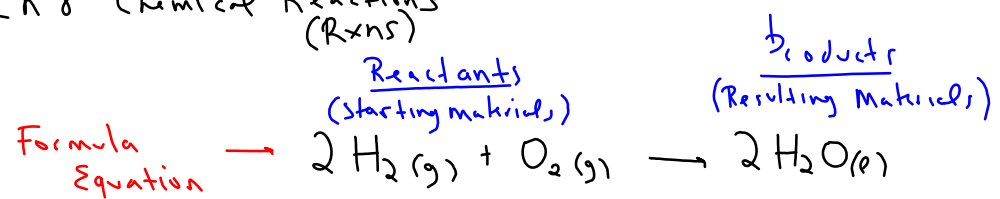


Ch 8 Chemical Reactions  
(RxnS)



word Eqn  $\rightarrow$

Ch 8 Chemical Reactions  
(RxnS)

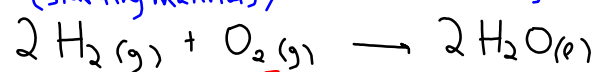


word Eqn  $\rightarrow$  Hydrogen gas Reacts w/ oxygen gas  
yielding water

Ch 8 Chemical Reactions  
(RxnS)

Reactants  
(Starting materials)

Product  
(Resulting Materials)



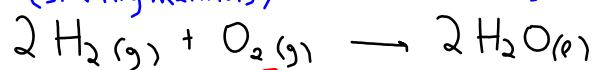
indicate state



Ch 8 Chemical Reactions  
(RxnS)

Reactants  
(starting materials)

product  
(Resulting Materials)



↑  
indicate state

(s) - solid

(aq) - aqueous

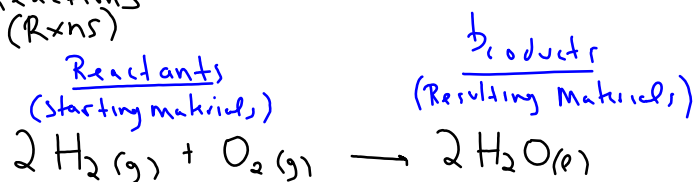
(l) - liquid

↓, (ppt) - precipitate forms

(g) - gas

↑ gas formed

# Ch 8 Chemical Reactions (RxnS)



indicate state

(s) - solid

(aq) - aqueous

(l) - liquid

↓, (ppt) - precipitate forms

(g) - gas

↑ gas formed

yield sign

$\Delta$  heat added

$\text{MnO}_2$

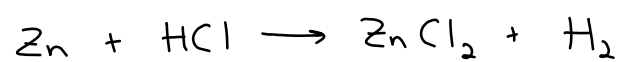
$\text{Pt}$

Catalyst  
add

Reversible

Balancing Eqns

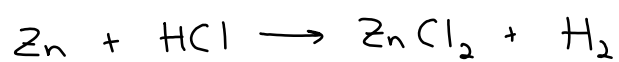
Balancing Eqns



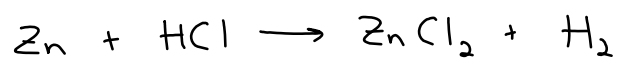


Balancing Eqns

Balancing Eqns By  
adding coeff.



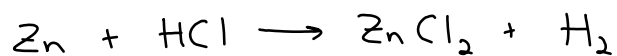
### Balancing Eqns



Balancing Eqns By  
adding coeff.

1. If word Eqn, write correct formulas (Remember diatomics)

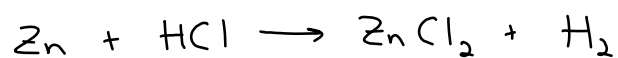
### Balancing Eqns



Balancing Eqns By  
adding coeff.

1. If word Eqn, write correct formulas (Remember diatomic)
2. Balance everything but H+O
3. Bal H

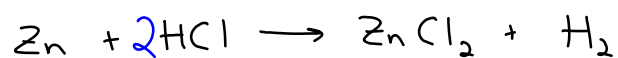
### Balancing Eqns



Balancing Eqns By  
adding coeff.

1. If word Eqn, write correct formulas (Remember diatomic)
2. Balance everything but H + O
3. Bal H
4. Bal O

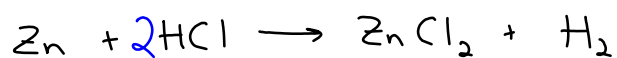
### Balancing Eqns



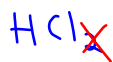
Balancing Eqns By  
adding coeff.

1. If word Eqn, write correct formulas (Remember diatomic)
2. Balance everything but H + O
3. Bal H
4. Bal O

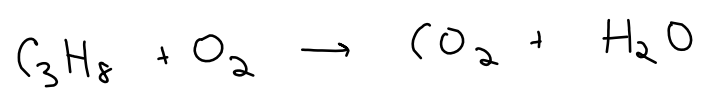
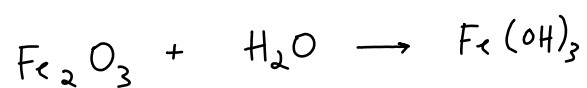
### Balancing Eqns



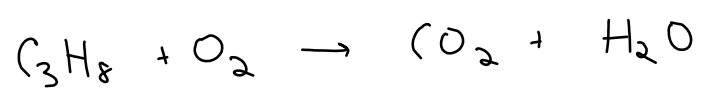
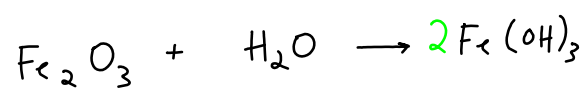
Balancing Eqns By  
adding coeff.



1. If word Eqn, write correct formulas (Remember diatomic)
2. Balance everything but H+O
3. Bal H
4. Bal O

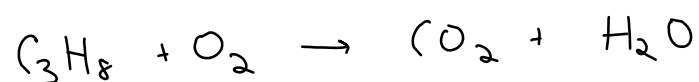
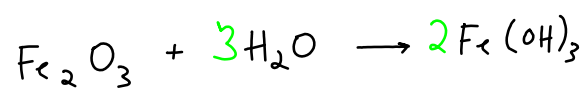


Magnesium chlorate Reacts w/ sodium nitrate  
yields magnesium nitrate and sodium chlorate

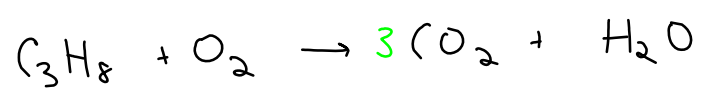
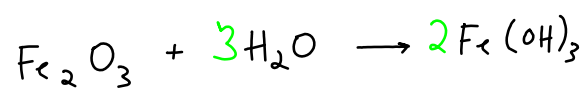


Magnesium chlorate Reacts w/ sodium nitrate  
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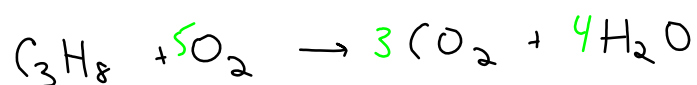
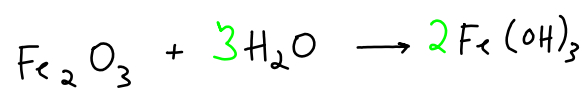




Magnesium chlorate Reacts w/ sodium nitrate  
yields magnesium nitrate and sodium chlorate

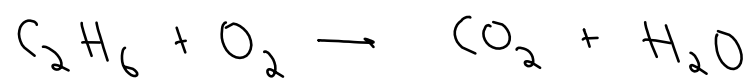


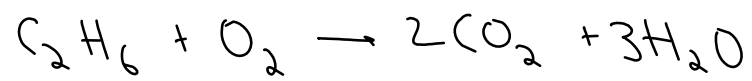
Magnesium chlorate Reacts w/ sodium nitrate  
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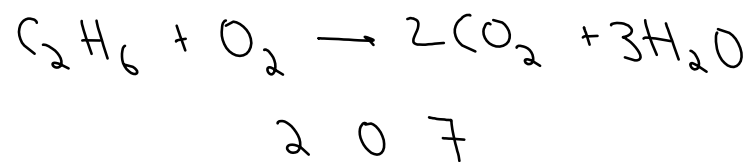


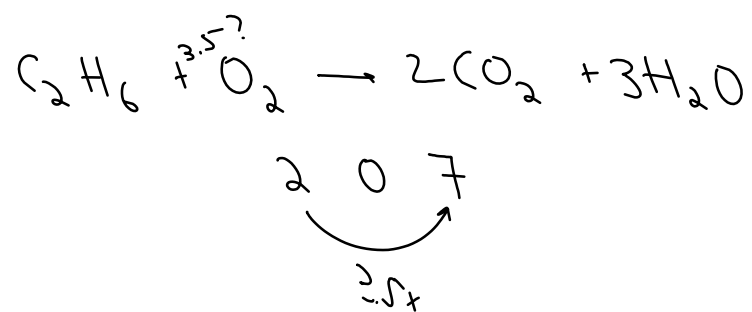
Magnesium chlorate Reacts w/ sodium nitrate  
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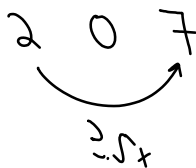














Types O'Rens

Types O'Rans

Synthesis  $(A + x \rightarrow Ax)$

Types O'Rxns

Synthesis  $(A + X \rightarrow AX)$

metal + nonmetal  $\rightarrow$  Ionic Comp

Types O'Rxns

Synthesis  $(A + X \rightarrow AX)$

metal + nonmetal  $\rightarrow$  Ionic Comp



Types O'Rxns

Synthesis  $(A + X \rightarrow AX)$

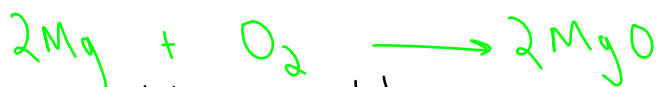
metal + nonmetal  $\rightarrow$  Ionic Comp



Types O'Rxns

Synthesis ( $A + X \rightarrow AX$ )

metal + nonmetal  $\rightarrow$  Ionic Comp



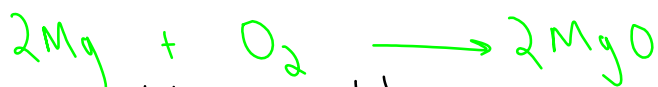
nonmetal + nonmetal  $\rightarrow$  covalent comp

comp. fin  
Based on  
ionic charges

Types O'Rxns

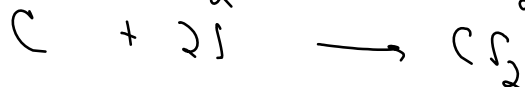
Synthesis  $(A + X \rightarrow AX)$

metal + nonmetal  $\rightarrow$  Ionic Comp



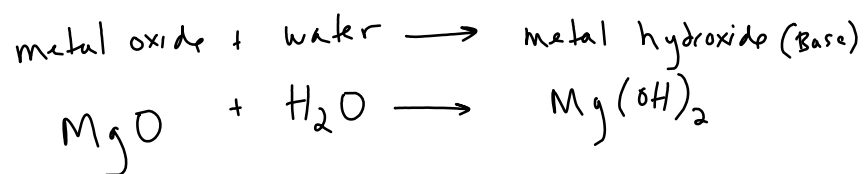
nonmetal + nonmetal  $\rightarrow$  covalent comp

comp. fin  
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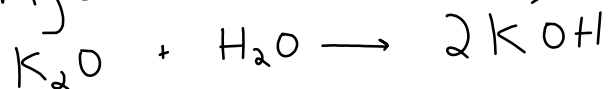
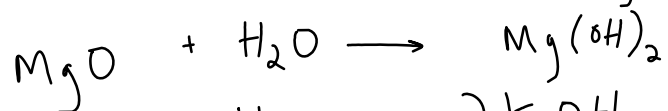


metal oxide + water  $\longrightarrow$  metal hydroxide (Base)

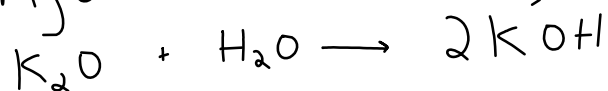
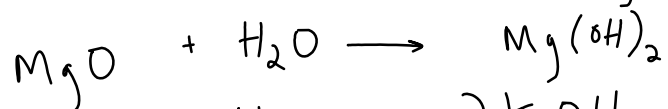




metal oxide + water  $\longrightarrow$  metal hydroxide (Base)

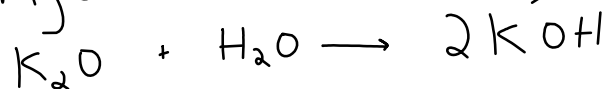
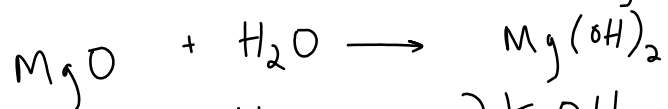


metal oxide + water  $\rightarrow$  metal hydroxide (Base)

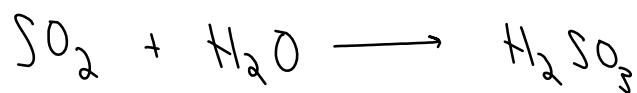
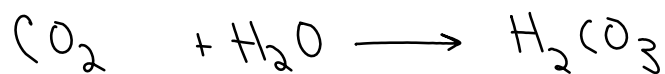


nonmetal oxide +  $\text{H}_2\text{O} \rightarrow$  Acid

metal oxide + water  $\longrightarrow$  metal hydroxide (Base)



nonmetal oxide +  $\text{H}_2\text{O} \longrightarrow$  Acid



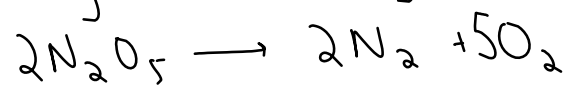
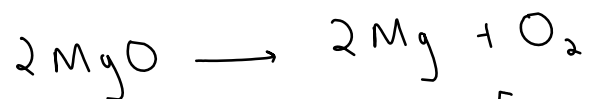
Decomposition  $(A \times \rightarrow A + X)$

Decomposition  $(AX \rightarrow A + X)$

Binary Comp  $\rightarrow$  Break into Respective  
elements

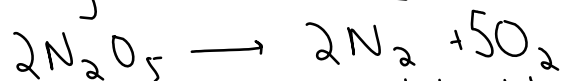
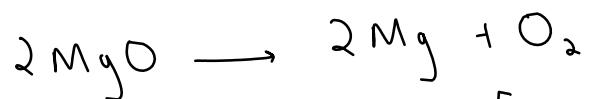
Decomposition ( $AX \rightarrow A + X$ )

Binary Comp  $\rightarrow$  Break into Respective  
elements



Decomposition ( $AX \rightarrow A + X$ )

Binary Comp  $\rightarrow$  Break into Respective  
elements

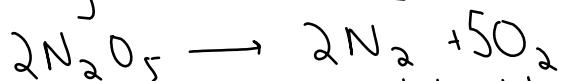
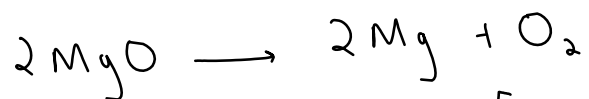


metal chlorate  $\rightarrow$  metal chloride + oxygen

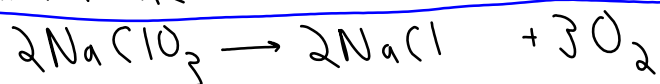


Decomposition ( $AX \rightarrow A + X$ )

Binary Comp  $\rightarrow$  Break into Respective elements

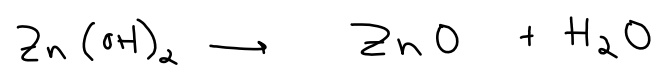


metal chlorate  $\rightarrow$  metal chloride + oxygen

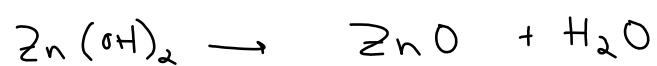


metal hydroxide  $\rightarrow$  metal oxide  $+ \text{H}_2\text{O}$

metal hydroxide  $\rightarrow$  metal oxide +  $H_2O$

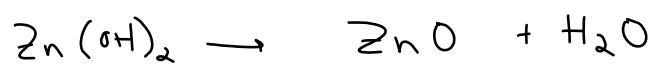


metal hydroxide  $\rightarrow$  metal oxide +  $H_2O$

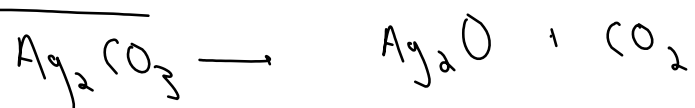


Metal carbonate  $\rightarrow$  metal oxide +  $CO_2$

metal hydroxide  $\rightarrow$  metal oxide +  $H_2O$



Metal carbonate  $\rightarrow$  metal oxide +  $CO_2$



Single Replacement Rxns

$$(A + BX \rightarrow AX + B)$$
$$(A + BX \rightarrow BA + X)$$

Single Replacement Rxns

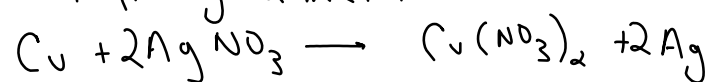
Single Replacement Rxns  $(A + BX \rightarrow AX + B)$   
 $(A + BX \rightarrow BA + X)$

metal Replacing a metal



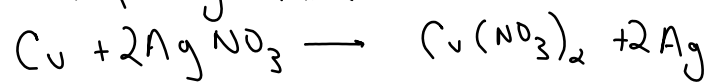
Single Replacement Rxns  $(A + BX \rightarrow AX + B)$   
 $(A + BX \rightarrow BA + X)$

metal Replacing a metal



Single Replacement Rxns  $(A + BX \rightarrow AX + B)$   
 $(A + BX \rightarrow BA + X)$

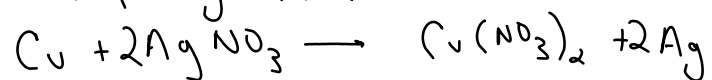
metal Replacing a metal



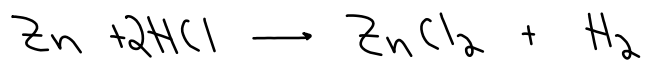
metal Replace H in an acid

Single Replacement Rxns  $(A + BX \rightarrow AX + B)$   
 $(A + BX \rightarrow BA + X)$

metal Replacing a metal

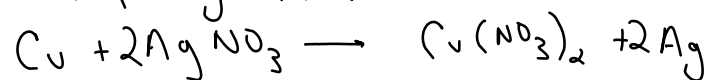


metal Replace H in an acid

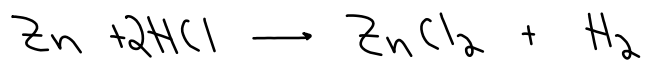


Single Replacement Rxns  $(A + BX \rightarrow AX + B)$   
 $(A + BX \rightarrow BA + X)$

metal Replacing a metal



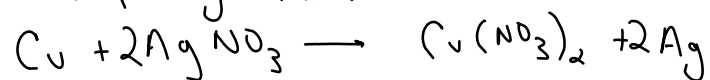
metal Replace H in an acid



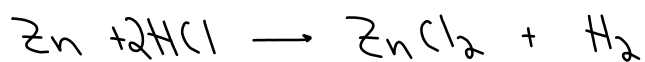
halogen Replace halogen

Single Replacement Rxns  $(A + BX \rightarrow AX + B)$   
 $(A + BX \rightarrow BA + X)$

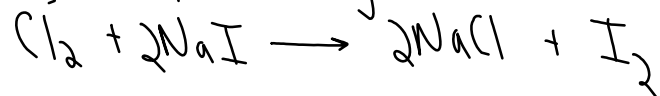
metal Replacing a metal



metal Replace H in an acid



halogen Replace halogen



Double Replacement

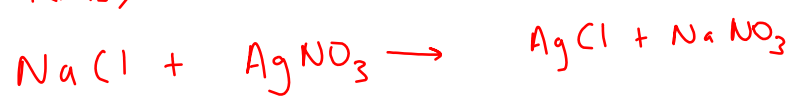
Double Replacement  $(AX + BY \rightarrow BX + AY)$

Double Replacement (AX + BY  $\rightarrow$  BX + AY)  
(ppt Rxns)

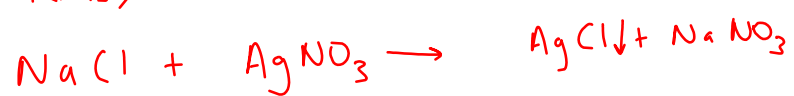




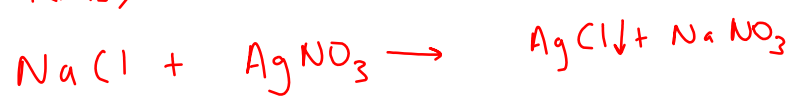
Double Replacement (AX + BY  $\rightarrow$  BX + AY)  
(ppt Rxns)



Double Replacement (ppt Rxns)  $(AX + BY \rightarrow BX + AY)$

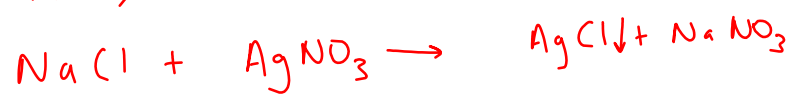


Double Replacement (AX + BY  $\rightarrow$  BX + AY)  
(ppt Rxns)



Neutralization (Acid + Base  $\rightarrow$  Salt + H<sub>2</sub>O)

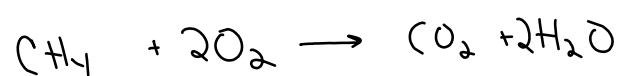
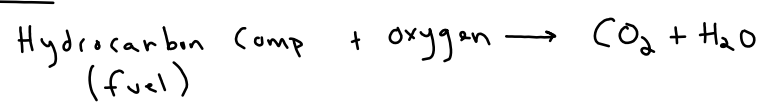
Double Replacement (AX + BY  $\rightarrow$  BX + AY)  
(ppt Rxns)



Neutralization (Acid + Base  $\rightarrow$  Salt + H<sub>2</sub>O)

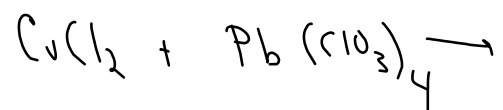
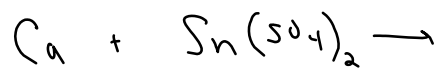
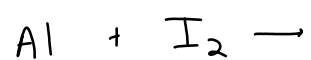


Combustion

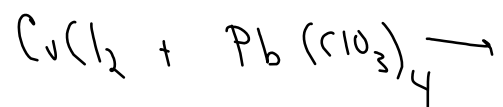
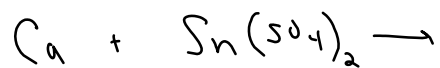
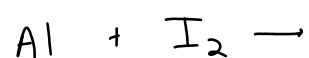


Predicting Rxn Products

Predicting Rxn Products



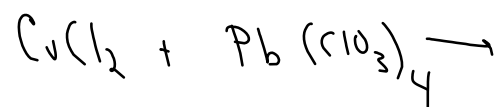
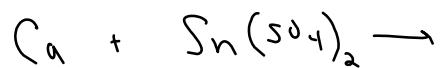
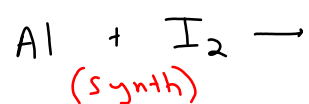
Predicting Rxn Products



1. Determine  
Rxn Type

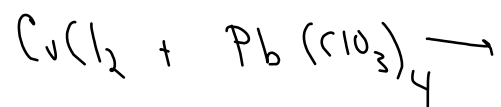
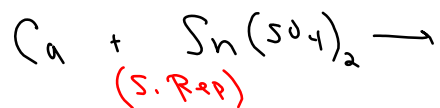
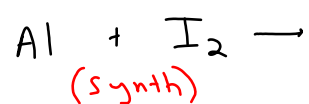


Predicting Rxn Products



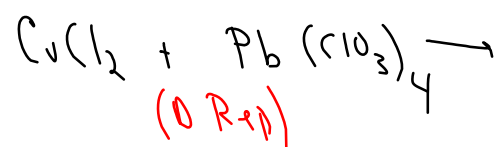
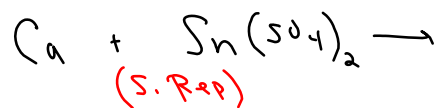
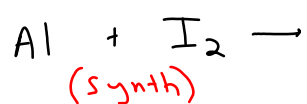
1. Determine  
Rxn Type

Predicting Rxn Products



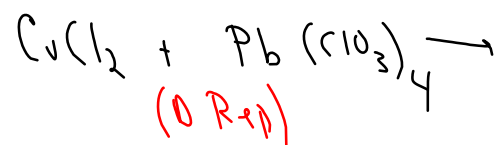
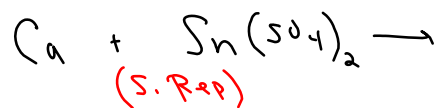
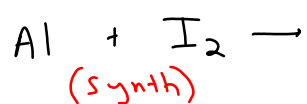
1. Determine  
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Predicting Rxn Products



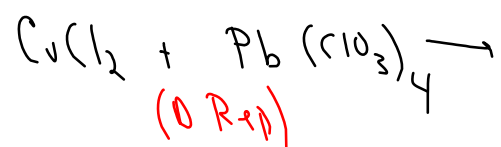
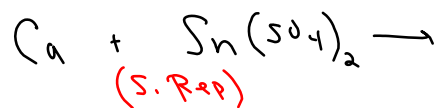
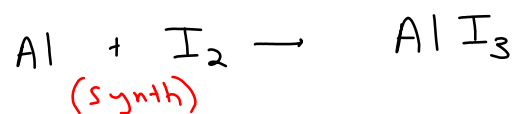
1. Determine  
Rxn Type

Predicting Rxn Products



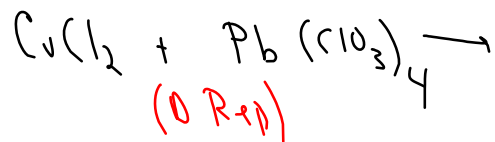
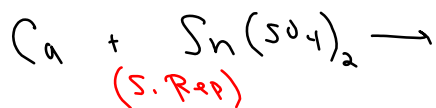
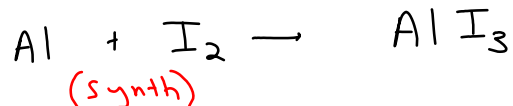
1. Determine Rxn Type
2. write products

Predicting Rxn Products



1. Determine Rxn Type
2. write products

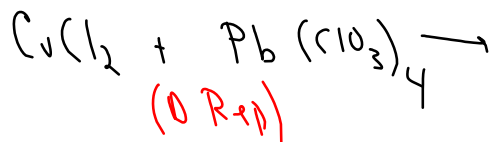
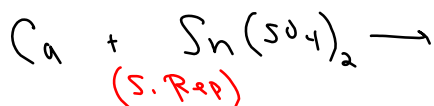
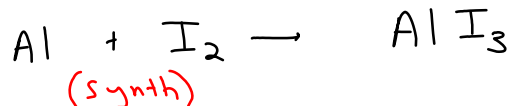
Predicting Rxn Products



Formulas  
predicted  
Based on  
charges  
of Ions

1. Determine Rxn Type
2. write products

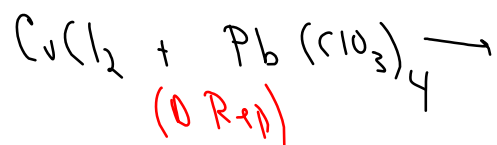
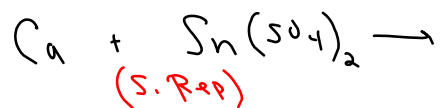
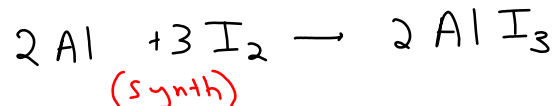
Predicting Rxn Products



Formulas  
predicted  
Based on  
charges  
of Ions

1. Determine Rxn Type
2. Write products
3. Bal Eqn

Predicting Rxn Products

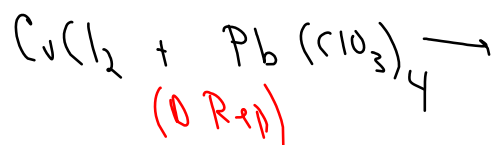
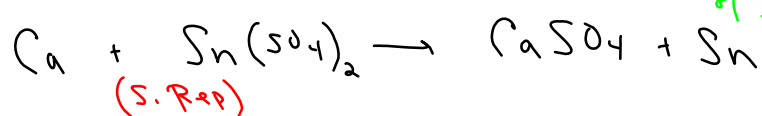
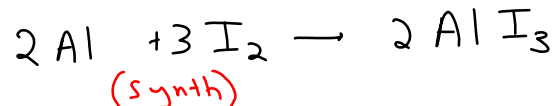


Formulas  
predicted  
Based on  
charges  
of Ions

1. Determine Rxn Type
2. Write products
3. Bal Eqn



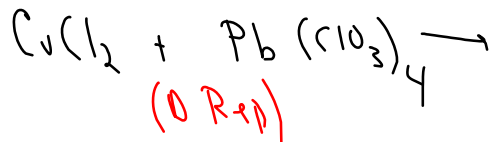
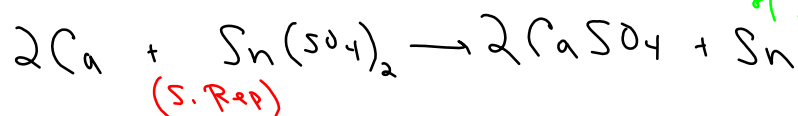
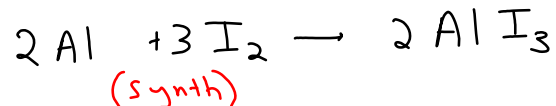
Predicting Rxn Products



Formulas  
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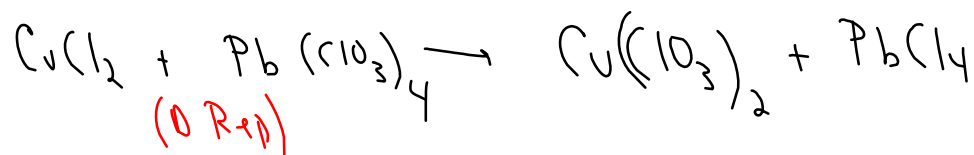
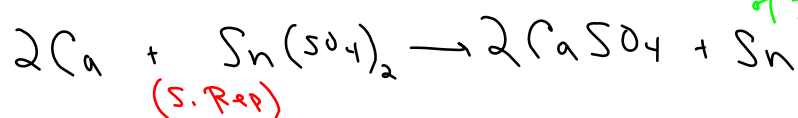
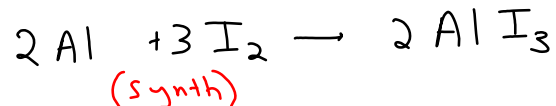
Predicting Rxn Products



Formulas  
predicted  
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charges  
of Ions

1. Determine Rxn Type
2. write products
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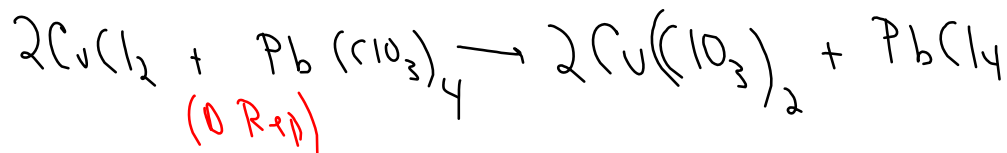
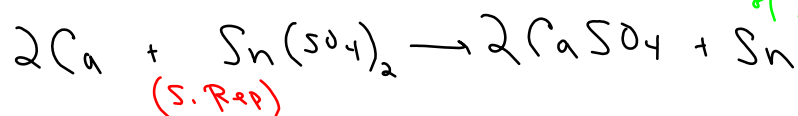
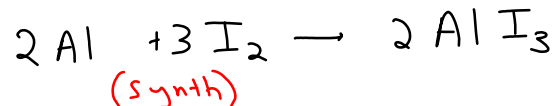
Predicting Rxn Products



Formulas  
predicted  
Based on  
charges  
of Ions

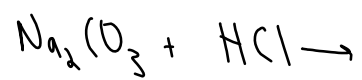
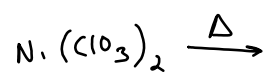
1. Determine Rxn Type
2. Write products
3. Bal Eqn

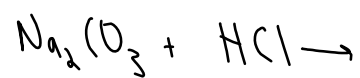
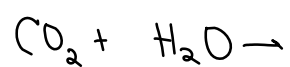
### Predicting Rxn Products

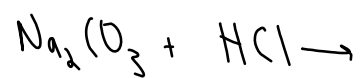
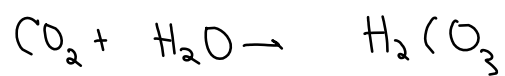


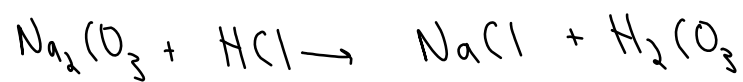
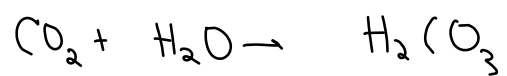
Formulas  
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1. Determine Rxn Type
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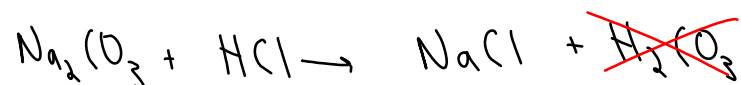
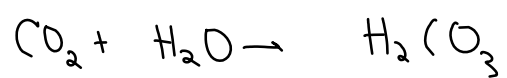




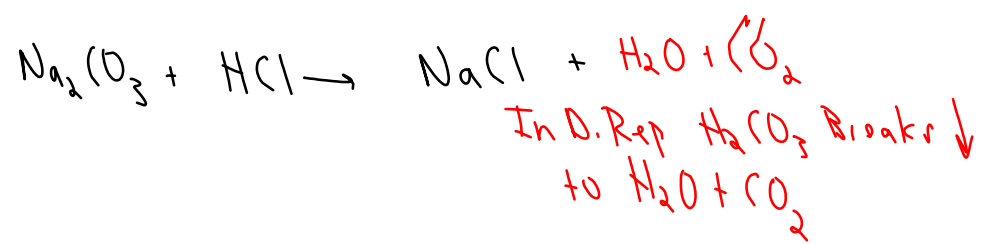
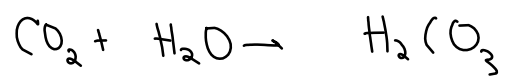






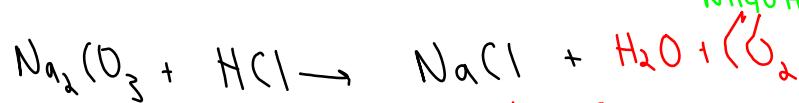
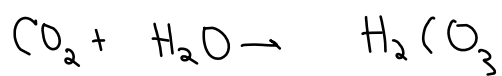


In D. Rep  $\text{H}_2\text{CO}_3$  Breaks  $\downarrow$   
to  $\text{H}_2\text{O} + \text{CO}_2$

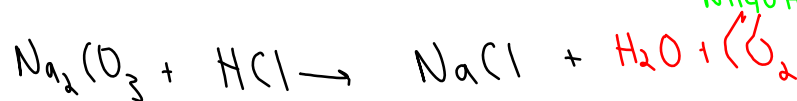
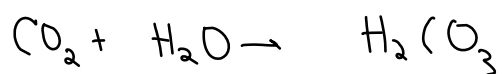




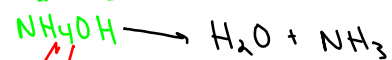
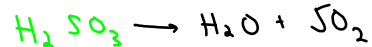
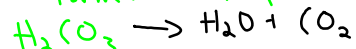
\* 3 Comp that  
Break down when  
formed D. Rep



In D. Rep  $\text{H}_2\text{CO}_3$  Breaks down  
to  $\text{H}_2\text{O} + \text{CO}_2$



\* 3 Comp that  
Break down when  
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In D. Rep  $\text{H}_2\text{CO}_3$  Breaks down  
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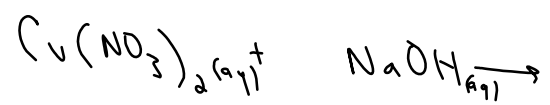
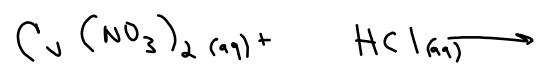
Will Rxns Occur?

Will Rxns Occur?

Double Replacement

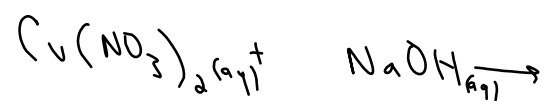
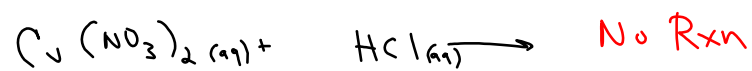
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Double Replacement



Will Rxns Occur?

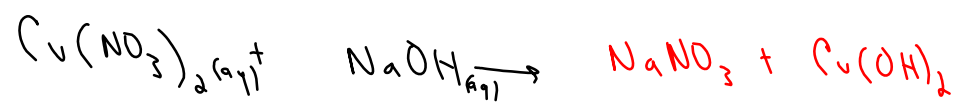
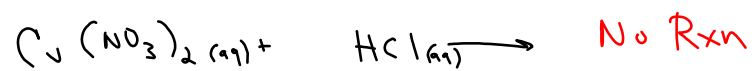
Double Replacement





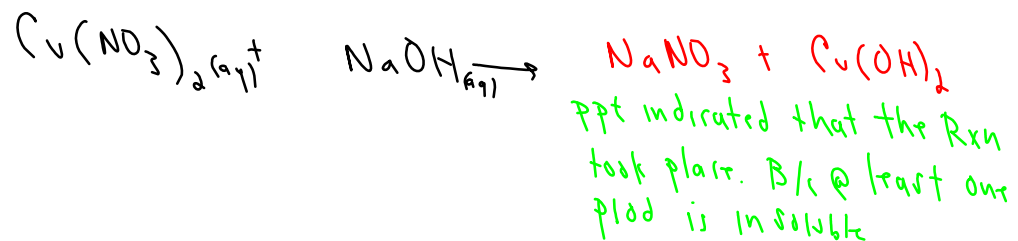
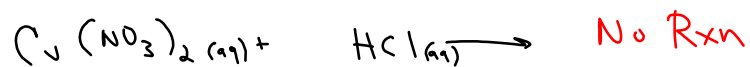
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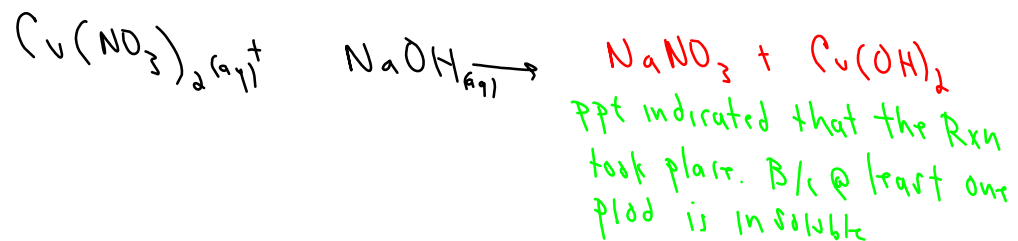
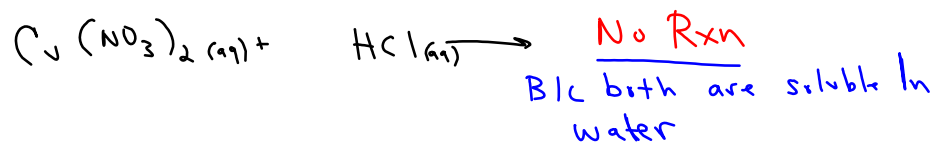
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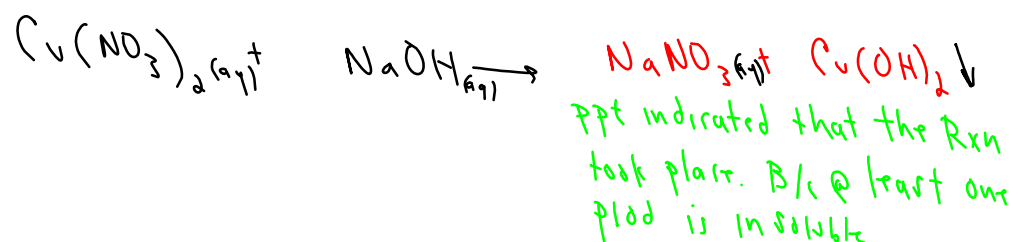
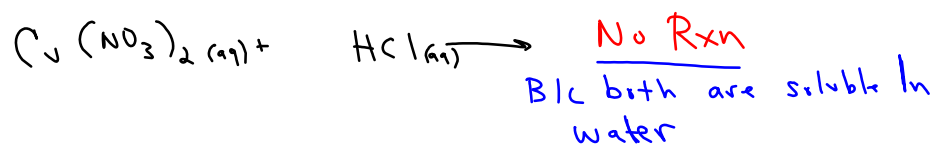
Will Rxns Occur?

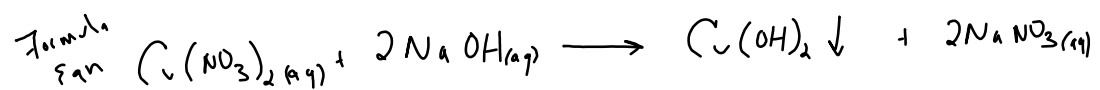
Double Replacement

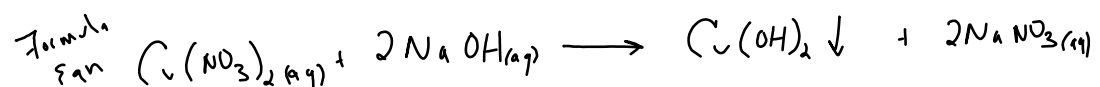


Will Rxns Occur?

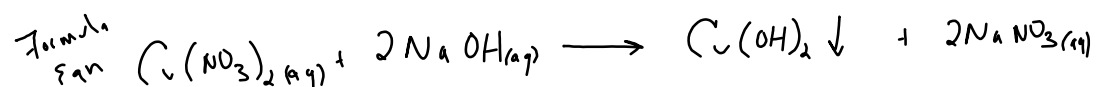
Double Replacement - occur when 1 product (at least) is insoluble in  $H_2O$ .



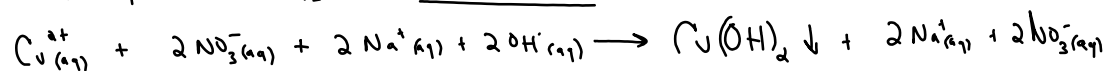


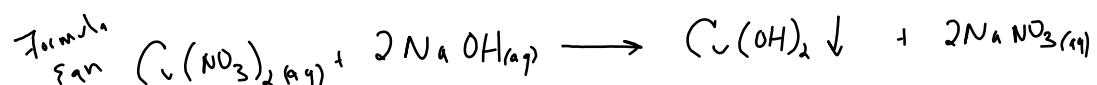


when ionic comp's dissolve in  $\text{H}_2\text{O}$  they break apart into their  
Respective ions - Disassociation

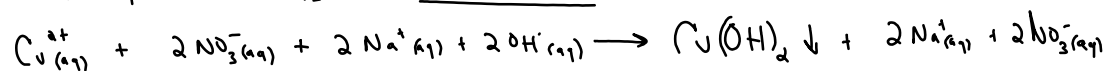


when ionic comp's dissolve in  $\text{H}_2\text{O}$  they break apart into their  
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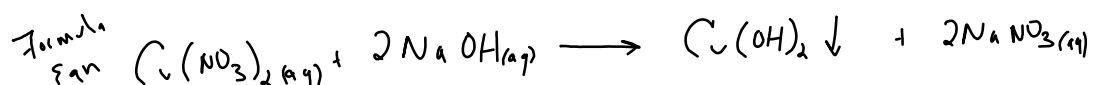


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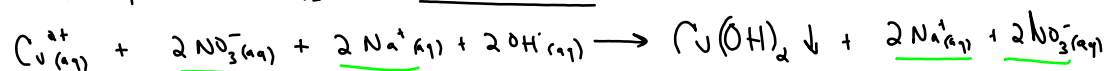


Ionic Eqn - Shows Reactants/Product that are dissolved in  $\text{H}_2\text{O}$   
as ions



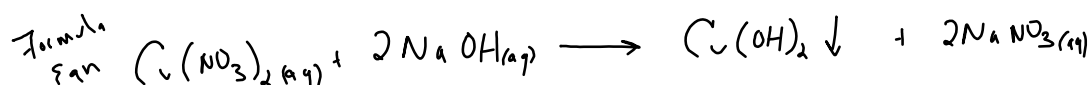


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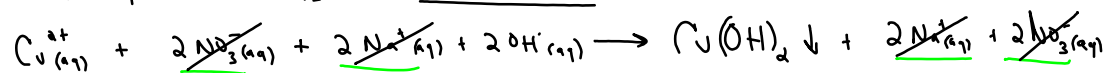


Ionic Eqn - Shows Reactants/Product that are dissolved in  $\text{H}_2\text{O}$   
as ions

Spectator ions - ions in the presence of a Rxn but not part of  
the Rxn

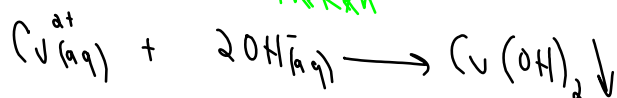


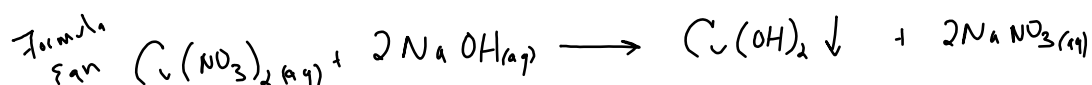
when ionic comp's dissolve in  $\text{H}_2\text{O}$  they break apart into their  
Respective ions - Dissecciation



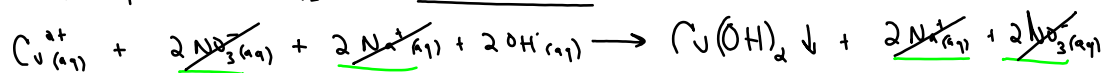
Ionic Eqn - Shows Reactants/Product that are dissolved in  $\text{H}_2\text{O}$   
as ions

Spectator ions - ions in the presence of a Rxn but not part of  
the Rxn



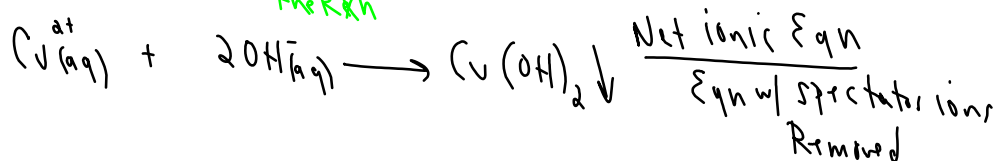


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Ionic Eqn - Shows Reactants/Product that are dissolved in  $\text{H}_2\text{O}$   
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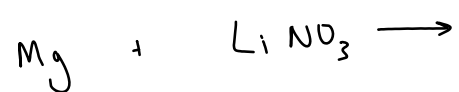


will S. Rep Rms take place?

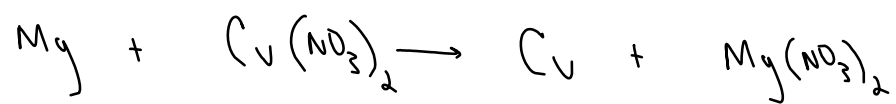
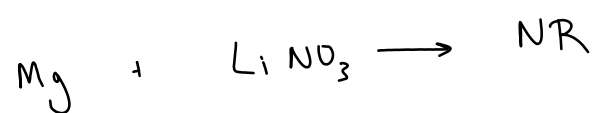
will S. Rep Rns take place?



will S. Rep Rns take place?

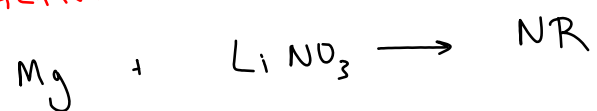


will S. Rep Rns take place?



will S. Rep Rxns take place?

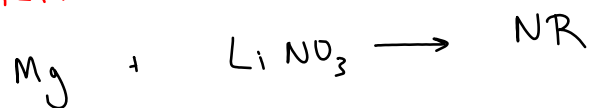
"Active Metal Replace less active metal"





will S. Rep Rxns take place?

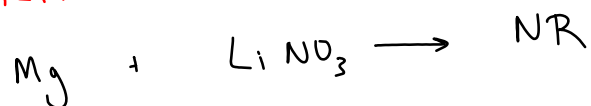
"Active metal Replace less active metal"



Mg is More Reactive than Cu so S. Rep occurs

will S. Rep Rxns take place?

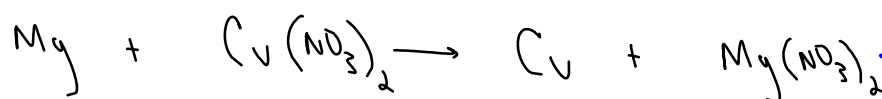
"Active metal Replace less active metal"



Mg less Reactive than Li so No Rxn

Intermed  
Reactivity

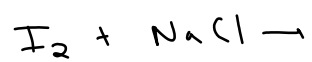
$\text{Li} > \text{Mg} > \text{Cu}$



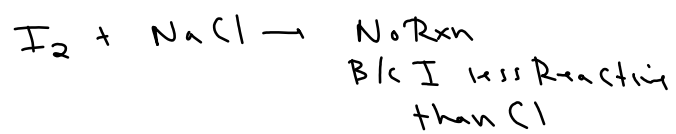
Mg is More Reactive than Cu so S. Rep occurs

Use activity  
Series to  
see if Rxns  
occur

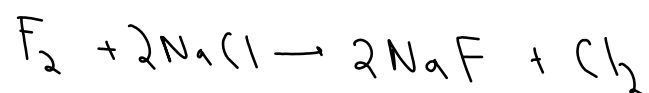
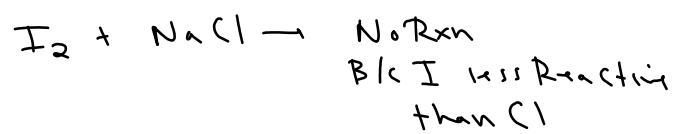
Active Halogen Rep. Less Active Halogen



Active Halogen Rep. Less Active Halogen



Active Halogen Rep. Less Active Halogen



Active Halogen Rep. Less Active Halogen

